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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/687,478 | 10/16/2003 | Christopher Patrick | 020026 | 7962 |
| 23696 | 7590 | 10/18/2004 | EXAMINER | |
| Qualcomm Incorporated Patents Department 5775 Morehouse Drive San Diego, CA 92121-1714 | | | TSAI, CAROL S W | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2857 | |

DATE MAILED: 10/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|--------------------------------------|---------------------------------------|--|
| Office Action Summary | Application No. 10/687,478 | Applicant(s) PATRICK ET AL. | |
| | Examiner Carol S Tsai | Art Unit 2857 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12, 15-24, 26, 33 and 38-55 is/are pending in the application.
- 4a) Of the above claim(s) 17-24, 26-33 and 38 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12, 15, 16 and 39-55 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 1-12, 15-24, 26, 33 and 38-55 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>July 6, 2004</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This application contains claims directed to the following patentably distinct species of the claimed invention:

- I. The species best illustrated by Fig. 7 (claims 1-12, 15, 16, and 39-55).
- II. The species best illustrated by Fig. 9 (claims 17-24, 26-33, and 38).

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, no claim is deemed generic.

Applicant is advised that a reply to this requirement must include an identification of the species that is elected consonant with this requirement, and a listing of all claims readable thereon, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

2. During a telephone conversation with Donald C. Kordich on October 4, 2004 a provisional election was made without traverse to prosecute the invention of Group 1, claims 1-12, 15, 16, and 39-55. Affirmation of this election must be made by applicant in replying to this Office action. Claims 17-24, 26-33, and 38 withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

3. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-3, 39-41, 54, and 55 are rejected under 35 U.S.C. 102(e) as being anticipated by U. S. Publication 2004/0176099 to Sahai et al.

With respect to claims 1 and 55, Sahai et al. disclose a method of estimating a parameter of a local maxima or minima of a function comprising: performing interpolation on samples of the function at or near a local maxima or minima, resulting in an interpolated local maxima or

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minima (see paragraphs 0014, 0088-0093, and 0103); deriving an interpolation offset comprising a deviation between locations of the interpolated local maxima or minima and a sampled local maxima or minima (see paragraphs 0096-0098); and deriving an estimate of the parameter from the interpolation offset (see paragraphs 0014, 0103, 0104, and 0108).

As to claims 39 and 54, Sahai et al. disclose a method of estimating a parameter of a local maxima or minima of a function comprising: performing interpolation on samples of the function at or near a local maxima or minima, resulting in an interpolated local maxima or minima (see paragraphs 0014, 0088-0093, and 0103); deriving an interpolation offset comprising a deviation between locations of the interpolated local maxima or minima and a sampled local maxima or minima (see paragraphs 0096-0098); and deriving an estimate of the parameter from the interpolation offset (see paragraphs 0014, 0103, 0104, and 0108).

Sahai et al. do not disclose expressly a memory tangibly embodying a sequence of software instructions for performing a method.

It is, however, considered inherent that Sahai et al. include a memory tangibly embodying a sequence of software instructions for performing a method (see Figs. 2-5 and paragraphs 0024 and 0033), because such elements are known to be necessary in order that the location of a receiver can be estimated.

As to claims 2 and 40, Sahai et al. also disclose the function being a correlation function (see paragraphs 0047, 0096, 0102, and 0103).

As to claims 3 and 41, Sahai et al. also disclose the correlation function being derived from a received signal (see paragraphs 0014 and 0029).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claim 4-12 and 42-52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sahai et al. in view of U. S. Patent No. 5,999,561 to Naden et al.

As noted above, with respect to claims 4, 11, 12, 42, 49, and 50, Sahai et al. disclose the claimed invention, except for the interpolation offset being determined by using a pre-existing relationship that is present between these two variables.

Naden et al. teach the interpolation offset being determined by using a pre-existing relationship that is present between these two variables (see Figs. 28 and 29 and col. 42, lines 5-65).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Sahai et al.'s method to include the interpolation offset being determined by using a pre-existing relationship that is present between these two variables, as taught by, in order to determine a best estimate of actual frequency offset.

As to claims 5-7 and 43-45, Sahai et al. also disclose a deviation between locations of interpolated and sampled peaks along a code phase dimension (see paragraphs 0035 and 0036).

As to claims 8-10 and 46-48, Sahai et al. also disclose a deviation between locations of interpolated and sampled peaks along a Doppler frequency dimension (see paragraphs 0030 and 0054).

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As to claims 51 and 52, Sahai et al. do not disclose the parameter bias being a peak energy bias.

Naden et al. disclose the parameter bias being a peak energy bias (see Figs. 28 and 29 and col. 42, lines 5-65).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Sahai et al.'s method to include the parameter bias being a peak energy bias, as taught by Naden et al., in order to determine a best estimate of actual frequency offset.

8. Claims 15, 16, and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sahai et al. in view of U. S. Patent No. 2004/0120387 to Bultan et al.

As noted above, with respect to claims 15, 16, and 53, Sahai et al. disclose the claimed invention, except for directly deriving an estimate of the parameter from the interpolation offset through an access to the lookup table.

Bultan et al. teach directly deriving an estimate of the parameter from the interpolation offset through an access to the lookup table (see paragraph 0043).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Sahai et al.'s method to include directly deriving an estimate of the parameter from the interpolation offset through an access to the lookup table, as taught by Bultan et al., in order that the quantized delay can be determined from selecting the nearest equivalent value from the lookup table in quantizer.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Kim discloses detecting first-arriving pulses in ultra-wideband communication, ranging, and positioning systems.

Sahai et al. disclose techniques for fine-tuning estimates of a delay value for a sampled signal.

Pollmann et al. disclose a system and method for enhancing the performance of an equalizer in a modem.

Kontola discloses a method for reducing the effect of multipath propagation in a receiver in which a code-modulated spread spectrum signal is received.

Meng et al. disclose a fast-tracking discrimination approach providing rapid acquisition useful for direct-sequence spread spectrum applications.

Abraham et al. disclose a method and apparatus for computing a convolution between an input GPS signal and a C/A code reference by generating the convolution result in real time without storing unprocessed signal samples.

El-Tarhuni et al. disclose a spread-spectrum radio communication system in which transmissions occur with varying amounts of delay and in which the delay of a received signal must be determined in order to despread the signal, a system for refining the initial estimate of delay and for tracking the delay during an ongoing communication by correlating the signal at the estimated delay, an increment earlier than the estimated delay, and the same increment later than the estimated delay, and interpolating the early and late correlations normalized by the

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correlation at the estimated delay and by the increment to determine a refined estimate of the delay.

Ashley et al. disclose an open-loop delay contour estimator generating delay information during coding of an information signal.

Burns et al. disclose motion compensated video signal processing apparatus, in which motion vectors are generated to represent image motion between a pair of input images of an input video signal, comprises means for comparing search blocks within one of the pair of input images with respective search areas, comprising a plurality of blocks, in the other of the pair of input images, to generate a first plurality of original correlation surfaces, each comprising an array of correlation values representing correlation between the respective search block and search area; means for generating a second plurality of interpolated correlation surfaces by interpolation from the original correlation surfaces; and means for generating a respective motion vector from each interpolated correlation surface, in dependence on a point of maximum correlation in that interpolated correlation surface.

Contact Information

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Carol S. W. Tsai whose telephone number is (571) 272-2224. The examiner can normally be reached on Monday-Friday from 8:30 AM to 5:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marc S. Hoff can be reached on (571) 272-2216. The fax number for TC 2800 is (703) 872-9306. Any inquiry of a general nature or relating to the status of this application or proceeding should be

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directed to the TC 2800 receptionist whose telephone number is (571) 272-1585 or (571) 272-2800.

In order to reduce pendency and avoid potential delays, Group 2800 is encouraging FAXing of responses to Office actions directly into the Group at (703) 872-9306. This practice may be used for filing papers not requiring a fee. It may also be used for filing papers which require a fee by applicants who authorize charges to a PTO deposit account. Please identify the examiner and art unit at the top of your cover sheet. Papers submitted via FAX into Group 2800 will be promptly forwarded to the examiner.



Carol S. W. Tsai
Patent Examiner
Art Unit 2857

10/05/04